

A. J. Burdett

PART 3.

FEBRUARY, 1909.

THE
BRITISH WARBLERS

A HISTORY WITH PROBLEMS
OF
THEIR LIVES

BY

H. ELIOT HOWARD, F.Z.S., M.B.O.U.

ILLUSTRATED BY HENRIK GRÖNVOLD

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CHIFF CHAFF.
AUTUMN PLUMAGE.

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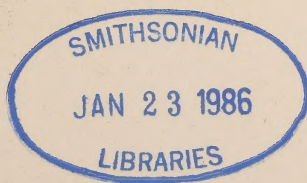
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„	„	♂	„
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„	„	♂	„
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Pallas's Willow-Warbler (coloured).					
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Female Chiff-chaff (Photogravure).					

TWO MAPS.

Showing approximate Geographical Distribution of Blackcap and
Garden-Warbler during Summer and Winter.



Amphispiza bilineata
American Pewee

BLACKCAP.

- Sylvia atricapilla**, Meyer, *British Birds*, folio Ed., vol. i (coloured plate figuring adult male, female, and egg) [1835-43]; Macgillivray, *British Birds*, vol. ii, pp. 339-344, fig. 170 (woodcut of head), 1839; Yarrell, *British Birds*, 4th Ed., vol. i, edited by Newton, pp. 418-422 (woodcut), 1873; Dresser, *Birds of Europe*, vol. ii, pp. 421-427, pl. 66 (coloured figures of adult male and female), 1875; Seebohm, *British Birds*, vol. i, pp. 394-399, pl. 10, fig. 3 (egg), 1883; Lilford, *Coloured Figures*, vol. iii, p. 56, pl. 28 (coloured figures of adult male and female), 1885; Saunders, *Manual of British Birds*, 2nd Ed., pp. 47-48 (woodcut), 1897.
- Curruca atricapilla**, Hewitson, *British Oology*, 1st Ed., vol. i, pl. 42, fig. (egg) [1836]; Gould, *Birds of Great Britain*, vol. ii, 2 pp, pl. 60 (coloured figures of adult male and female), 1865; Booth, *Rough Notes*, vol. ii, pp. 49-50, 1884.
- Curruca atracapilla**, Hewitson, *Eggs of British Birds*, 2nd Ed., vol. i, pp. 93-94, pl. 27, figs. 1 and 2 (eggs), 1846.
- Sylvia atracapilla**, Hewitson, *Eggs of British Birds*, 3rd Ed., vol. i, pp. 126-27, pl. 34, figs. 1 and 2 (eggs), 1856.

Croatian, *Crnoglava grmuša*; Danish, *Munk*; Dutch, *Zwartkop*; French, *Fauvette à tête noire*; German, *Mönch-Grasmücke*; Hungarian, *Bárdka poszáta*; Italian, *Capinera*; Norwegian, *Munk*, *Sorthaette*; Swedish, *Svarthufvade Sångaren*; Russian, *Tschernogolowka*; Polish, *Pokrywka czarnogłowa*.

DESCRIPTION OF THE PLUMAGE.

Adult Male in Spring.—The crown is pure black with a slight bluish gloss. The hind neck and the sides of the head are pure ashy grey, and the mantle and rump the same colour, but distinctly washed with olive. The upper parts of the wings and tail are olive grey, the large feathers being edged with a lighter tint of the same colour, and the shaft of both wing and tail-feathers reddish brown. The throat, chest, and flanks are ashy grey, but the colour on the flanks is rather lighter and washed with olive buff. The abdomen is white, and the under tail-coverts whitish grey with ashy grey

centres. The under part of the tail is ashy grey, the shafts of the feathers being white. The under side of the wing and the larger under wing-coverts are grey, edged with whitish buff, the axillaries olive buff, and the smaller under wing-coverts light whitish olive with dusky centres. The iris is dark brown, the small feathers on the upper eyelid being blackish, while those on the lower are white, and the lores ashy grey. The bill is bluish lead colour, and the tip of both mandibles horn black. The palate is light lavender grey, and the inside of the chin and the tongue fleshy buff. The legs are of a light lead colour, the soles having a wash of olive, and the claws dark grey.

Adult Male in Autumn.—The colouring does not differ very much from that of the spring, excepting that the back and rump are more distinctly washed with olive. The chin is whitish olive, and the abdomen has a distinct wash of light yellowish buff.

Adult Female in Spring.—The crown is of a dull umber hue, and the sides of the head and the nape ashy grey. The under parts are ashy white, washed, but not very conspicuously, on the crop and upper sides of the breast with olive ochre. This same colour extends down the flanks, becoming slightly darker and richer towards the crissum, whereas the centre of the abdomen is left ashy white. The under tail-coverts are ashy white near the body, becoming olive ash towards the tip. The upper part of the tail is ashy grey washed with olive, and the under part ashy grey. The under wing-coverts are whitish ash washed with light olive ochre, and the under side of the flight-feathers grey, edged with whitish ash. The feathers on the upper eyelid are the same colour as those on the crown, those on the lower whitish grey. Upper mandible is dark horn colour, lower lead blue slightly darker at the tip.

Nestling.—The crown is brownish buff. The upper parts are olive grey, flight-feathers slate colour, wing-coverts and innermost secondaries edged with olive grey. The throat is

BLACKCAP

buff, and the crop, sides of the breast, and flanks rather a light olive buff. Under parts and under tail-coverts are buff, and the crissum whitish. The feet are flesh colour with a tinge of lavender.

The gape is reddish flesh with a tinge of ochre, and the tongue the same colour with two dusky spots near the root.

The bill is dark horn colour, and the corner of the mouth yellow. Iris bluish black, lower eyelid ochre, and the lores slaty grey.

On leaving the egg the bird is naked, with eyelids completely sealed. The skin is flesh colour, but more lilac on the throat, back of the head, and spine, and orange red where the lungs are visible. The corner of the mouth is whitish flesh and the gape and tongue flesh colour, the latter having two light ash grey spots and a central red line. The feet are of a transparent flesh colour.

Immature.—The plumage differs only slightly from that of the adults, except that the young male has the cap dark rusty umber brown. The colour of this cap changes during the winter, and the bird returns in the spring as a rule with it black, but in some cases the change has not then reached completion, the tips of the feathers being still brown.

A dark variety in which the head, throat, and upper breast are blackish, and the remainder of the plumage much darker, has been met with in the countries bordering the Mediterranean, Madeira, Cape Verd and Canary Islands.

GEOGRAPHICAL DISTRIBUTION.

Through the whole of **England** and **Wales** it is generally distributed, but rather local in parts of Cornwall, Lincolnshire, Cumberland, Anglesey, and Caernarvonshire.

As a breeding species it becomes scarce in **Scotland** above the Firths of Clyde and Forth, being very rare in the northern parts. There are records of its occurrence from the Outer

Hebrides and the Island of Jura. On the East Coast it breeds as far north as Inverness, and on migration is found regularly in the Orkney, Shetland and Faroe Islands. To **Ireland** it is a local summer visitor, rare in many counties, but breeding regularly in Dublin, Wicklow, Kildare, and Queen's County.

Its occurrence in the **Channel Islands** except Guernsey seems doubtful.

In the **Cape Verd Islands**, **Canary Islands**, **Madeira**, **Azores**, and the countries bordering the Western Mediterranean it is a common resident species.

Over **Central Europe** and **Southern Scandinavia** it is generally distributed and common as a breeding species, and we find it occurring regularly, though in gradually lessening numbers, as far as 66° N. Lat. Records have been obtained as far north as the Lyngen Fiord. Proceeding eastward from here we find it somewhat scarce in **Finland**, occurring principally in the vicinity of Helsingfors, Uskela, Kuopio, and as far north as Uleaborg. In the **Province of Olonetz** it has been recorded near Petrozavodsk, Witegra and Kargopol, and on the River Dwina as far as 62° N. Lat. It also visits the **Province of Viatka**, and appears to be much rarer on the eastern slopes of the Ural Mountains than on the western.

In **Southern Europe** it is found throughout **Italy** and the **Islands of Corsica and Sardinia**, but in **Greece** it is rare as a breeding species, though common during the winter, and occurs on migration in **Crete**. In **Montenegro** and **Turkey** the bird is not plentiful as a breeding species, but passes through the latter country on migration. To the **South-western Provinces of Russia** and throughout the **Caucasus** it is a frequent visitor, but it is doubtful whether it breeds in the Crimea, although it occurs on migration. In **Trans-Caucasia** it is by no means uncommon, being found from Abkhasia in the west to Lenkoran in the east, and on migration it visits the Caspian Steppes. In parts of **Asia Minor and Persia**, as far east as Teheran, it appears to be a resident species.

BLACKCAP

During the winter it visits the **Soudan, Abyssinia, Somaliland** and **British East Africa** as far south as the **River Athi**.

Solitary individuals remain in the south of **England** and **Ireland** during the winter months.

LIFE-HISTORY.

There are many facts in the life of this bird which are good examples of the contradictory nature of the evidence a naturalist has often to face, and this makes the character of the species an unusually interesting one. The different individuals are full of energy, very restless, and, in addition, not only possess a number of characteristics common to many of the lower animals, but possess them in a greater degree than other closely allied species. Whatever part, therefore, they have to play, whether quarrelling, singing, making preparations for and tending their young, or exhibiting apparent jealousy towards their neighbours, they do it to the best of their ability. This is probably why they are so much in evidence in the woods and groves they love to inhabit, and this is also the cause of the endless peculiarities of character, of which each member of the species partakes alike.

Their arrival, which does not seem to depend upon any climatic conditions here, but is no doubt influenced by the prevailing winds outside the British Islands, is very erratic. The earliest date I have noticed is March 30th, but on the other hand, it has been as late as April 23rd before the first one reached this district.

The first males are solitary individuals scattered through the country; they might be called forerunners, since there is often a pause of a few days before the general body of the migrants follow.

Until recently I believed that these males were always mature, with both plumage and song fully developed, but I

now find that, in some years, the immature birds are the first to arrive. There is little difficulty in deciding this, since, compared to the fully developed males, these immature individuals are inferior in beauty; their plumage is dull, the feathers appearing to lack sufficient colouring matter, and in some cases the black feathers on the head are still tipped with brown. The difference also in the quality of the feathers is very striking, which, while lacking the finish and gloss of the older birds, resemble more nearly the undeveloped plumage of the young on leaving the nest. The inferiority with regard to the song is even more marked, the immature birds not possessing so great a variation nor the same richness of tone. But some recognised definition of the term "mature" is really needed. We cannot judge by any one particular phase of plumage, since there is little doubt that the colour increases in intensity and the growth of the feathers continues for some years, possibly throughout the life of many species. It is probable that it will ultimately be found that the quality of the plumage and the richness of the song develop correspondingly. There is only one logical definition of the term, *i.e.*, the age at which an individual attains to the power of sexual reproduction.

Wooded banks and dingles, coppices, gardens with plenty of evergreens, and woods in which the timber is annually felled, and in which, consequently, there is an abundance of undergrowth, are the favourite resorts of these birds, provided that there are sufficient trees overgrown with the common climbing ivy (*Hedera helix*) close at hand, for they live on the fruit of this ivy until there is sufficient insect food to maintain them; which is probably for two or three weeks after their arrival, but the time varies according to the condition of the season and the development of insect life.

There are few more spring-like sounds than the song of the male; it has, in fact, a peculiar cheerfulness, which alone seems to transform winter into spring. Arriving during the night, he commences to sing soon after dawn, but the energy

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MALE BLACKCAPS
WHILE FIGHTING FOR THEIR BREEDING TERRITORY
ATTACKED BY A MALE CHIFF-CHAFF

BLACKCAP

imparted to his song depends to some extent, at this early stage of the season, on the weather. Cold winds do not suit him ; on the other hand, sunshine is not a necessity, but warmth, no matter whether accompanied by dampness or actual rain, he must have, if he is to enjoy life to the full. On cold mornings in April he often establishes himself on the top of some high tree, and here for a while remains in meditation and song, gathering what comfort he can from the warmth of the feeble rays of the rising sun, that glisten on his breast as he preens his feathers, while below everything is white with frost. Presently, leaving his perch, he flies direct to the nearest ivy berries, and having rapidly swallowed six or more, rests while digestion takes place, then again goes in search of another quantity. While thus resting he either warbles quietly to himself for some minutes together, finally bursting out into song, preens his feathers, or sits with all his feathers relaxed. If cold winds prevail he makes his way during the daytime to the more sheltered spots, where he can enjoy what sunshine there may be. I have sometimes found the males, early in April, in a quiet corner on the outskirts of small woods gathered together on the low bushes, there sunning themselves, with their feathers relaxed and fluffed out in their peculiar manner.

Each male on his arrival regards a space of ground within certain limits as his peculiar breeding territory, and if two, arriving during the same night, happen to have settled in the same locality, a severe fight for possession ensues. During these battles their whole attitude is expressive of intense rage, their feathers are drawn closely to their bodies, but their black head-feathers are raised ; they fly at one another, and, meeting in the air, peck furiously at each other as they flutter round and round. Such fights are evidently a great exertion, for, when resting after each trial of strength they sit with bills open, panting for breath, before they again dart off, flying very rapidly in and out of the trees.

The note principally uttered is the one used by the male

under stress of intense excitement, a low, lengthened kind of whining, very plaintive, resembling in some measure the word *pheu*, but they sometimes make a curious gurgling sound, which seems to be produced low down in the throat. But it is not only when two males happen to have settled in the same locality on the same morning that these fights take place. I remember one case in which a male, having arrived some days previously, was even engaged in courting a female, when another male, undoubtedly a new arrival, appeared on the scene, and a severe struggle ensued. The new-comer was immediately attacked and flew away pursued by the owner. The flight of both males was slow, and in the course of it they circled in and out of the trees, so that they kept returning to where I was standing, and I was thus enabled to witness a great part of the contest. The intruder would settle, and the owner would immediately do the same quite close to him, never for a moment leaving him alone, but compelling him, by incessant attacks, to move from place to place. In this way the fight actively proceeded for a considerable time, the intruder sometimes retaliating, which resulted in a fierce struggle, both birds falling to the ground locked together, where they would remain fluttering and rolling about. During the pauses in the contest both males sang, but the intruder's song was neither so loud nor so vigorous as his opponent's. The female did not follow the combatants, and the owner, who had previously been courting her, seemed to neglect her during the struggle. As far as I was enabled to judge, she remained an uninterested spectator at the opposite end of the territory, though when the fight was over I saw her again close to the owner. The males, on the first morning after their arrival, are not always antagonistic, for I have seen two, which had only just arrived, evidently on the most friendly terms, following one another and feeding within a few feet on the same branches, one of them, apparently the leader, frequently singing, the other following in his wake.



MALE BLACKCAP

ATTITUDE ASSUMED WHEN CARRYING A PIECE OF
DEAD COW-PARSNIP PREVIOUS TO THE ARRIVAL OF A FEMALE

BLACKCAP

Until a female arrives in his territory, the male spends much of his time in song. He makes use of a particular branch upon a particular tree, perched upon which he, morning after morning, pours out his song or preens his feathers. This branch may be called the headquarters of his territory, and I have noticed that it is sometimes a conspicuous one, projecting from the other branches, from which a clear view of the surrounding neighbourhood can be obtained. In order to see how invariably he makes use of it, it is only necessary to remain in hiding a short time somewhere close at hand. He leaves it when searching for food, or attacking another male, but, after finishing whatever active task he may be engaged in, he will return without much delay. After a female has arrived and mating has taken place, he seems to attach less importance to the branch, transferring his headquarters to the nest.

I once saw a male, almost the first I had noticed that year, flying excitedly from tree to tree carrying a piece of dead cow-parsnip (*Heracleum sphondylium*) in his bill. I should not attach much importance to such an isolated action, had I not seen a similar occurrence in the case of another species, the Whitethroat; which makes me inclined to think that our knowledge is defective, and that such actions may not be of uncommon occurrence. There is little doubt that it is in some way connected with the well-known and unexplained habit, found amongst the males of many species, while courting, of picking up and carrying some piece of dead vegetation in their bills; but in these two specific instances no females had arrived. Such actions may be an outward sign only of the one absorbing feature of the bird's existence at this time, the *redeuntio amoris*, a feature in which the construction of the nest forms an important part, but it is also possible that there may be a deeper meaning attached to them, and that they may have preceded, in the course of development, the construction of the nest.

The females commence to arrive about the middle of April,

generally some days after the first male ; but the migration of the sexes overlaps, males continuing to arrive with the females. There is as great a variation in the plumage of the females as in that of the males, the immature birds being easily distinguished by their dull appearance and by a conspicuous absence of that intensity of colouring and development of feather which are such prominent beauties of a more fully mature bird.

The duration of the courtship depends, I believe, solely upon the female ; for it sometimes happens that on her arrival she is not in a condition to breed, and in such a case she passes unnoticed amongst the unpaired males, her presence having no exciting influence upon them ; she is thus allowed to seek her food and pursue her way unmolested. But this is by no means a usual occurrence ; her presence is generally a signal for an intense outburst of sexual passion. In no other way, it seems to me, can we account for the variation in the duration of the courtship. In one year, for instance, in which the males were very late, a solitary female arrived first. The first male that arrived paired immediately with this female ; there was little excitement or courtship, the nest was rapidly built, and the young were hatched within a month from the date of his arrival. But, on the other hand, it is by no means uncommon to see pairs actively engaged in their courtship for many mornings in succession.

By the term *courtship* I refer always to the period between the time in which a female settles in the territory of a given male and the time when the first egg is laid. This period is always one of excitement to the male ; an excitement which, varying in intensity with the nervous organisation of the species, vanishes temporarily the moment the sexual passion is relieved, but reappears, although in a lesser degree, before each act of coition.

There seems indeed to be some connection between the



MALE BLACKCAP

ATTITUDE ASSUMED WHEN ANGRY WITH ANOTHER MALE
AND ALSO SOMETIMES WHEN IN PRESENCE OF THE FEMALE DURING THE

PERIOD OF SEXUAL ACTIVITY

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intensity of this excitement and the length of time that the male has been previously absent from the female; for I have noticed that, amongst the majority of the migratory species, the excitement, as evinced by their actions, is much greater than the average excitement displayed at the corresponding period amongst resident species. In this respect it is almost possible to trace a distinct gradation, commencing with those species that pair for life—in which case the excitement is limited to the time immediately preceding coition—up to the migrants, which represent the highest type of such excitement. That there should be such gradations can be readily understood if it is accepted that all the special activities of this period are directly caused by the development and stimulation of the sexual organs; for resident species probably pair before such development has taken place, consequently the natural passion can be immediately relieved; this is also the case with species that pair for life, but amongst the migrants the conditions are very different, for the males, as a rule, arrive before the females, and being sexually developed, are excitable and possessed of great energy, which reaches its height only on the appearance of the female. A study of the males from this point of view is interesting and, to myself, very convincing. I am, therefore, inclined to doubt whether the term “courtship” is really admissible, whether, in fact, an altogether erroneous impression is not thereby conveyed. And, as bearing on this question, it is a fact of no small importance that the males generally pair with the females that first settle in their territory, before whom they have behaved in the manner referred to, and ultimately rear with them offspring in that territory.

It is difficult to describe the excitement of the male when a female is present; the variations in the sounds he produces and the antics he performs are so numerous. The intensity of his emotions soon discloses the fact that a female has arrived, and it is then no difficult matter to approach him closely, the more so as he is never very far distant from

the female; and she, at this time, seems to be decidedly happier low down amongst the bushes than higher up amongst the trees. She travels unconcernedly from bush to bush in search of food, and he follows her, but, owing to his frequent fits of excitement, often lags some little distance behind. This is especially the case when she happens to pass through some dense thicket, such as honeysuckle (*Lonicera Periclymenum*), to which he has followed her, and in the middle of which he is entirely concealed. In such a place he will pause and burst forth into a curious jumble of musical and unmusical strains. At first you hear a number of highly pitched squealing sounds, then a pause, then a series of perfect imitations of different species, such as the Nightingale, Garden-Warbler, Whitethroat, Marsh-Warbler, Starling, Linnet, or even the "chuckle" of the Blackbird; then again a pause, or perhaps without a break his true song, at first uttered in a whisper that is scarcely audible, then rising and swelling to a pitch of almost fury, and finally finishing with his wonderful liquid and beautiful notes. Walking round the bush in which he was thus singing, I have tried to get a glimpse of him, generally without success, but occasionally I have had an opportunity of watching him closely; the distended throat and quivering body bear evidence to the tremendous effort necessary to produce some of the sounds. Some of the quiet whispering notes are produced with the bill scarcely open at all, but they nevertheless seem to require considerable power. After singing thus for some minutes he again bethinks himself of the female, who, in the meantime, having passed on regardless of his performance, is possibly some distance away. He therefore goes in search of her, and if unable to find her, calls to her, a summons which promptly elicits a note in reply; or the reverse may be the case, when she, missing his companionship, calls to him, opening her bill very wide and producing a harsh grating sound. As a rule he knows in which direction she has gone, and bursting out of his hiding place and flying towards her with the slow



MALE BLACKCAP
ATTITUDE ASSUMED DURING THE
PERIOD OF SEXUAL ACTIVITY

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SWAN ELECTRIC ENGRAVING CO.

BLACKCAP

but very pretty flapping flight, similar to that used by other species under stress of great excitement, he settles near her, and gives expression to his feelings by the long low plaintive whistle to which I have already referred when speaking of the contests for the breeding territory. If she happens to be calling him, he may possibly dart out at her, and they will then both twist and tumble about in the air. In some cases the male will keep returning to his particular branch at the top of some tree, from which, when the female is present, he darts headlong into the bushes, gradually working his way back again to the favourite branch. During the courtship there always seems to me a distinct unwillingness on the part of the male to go beyond the boundaries of his territory; the female often does so, and this, I believe, is a cause of their being apart from one another for short periods of time, and it may be that during these periods the male returns to his favourite branch, behaving as he usually does on his first arrival, but no doubt keeping a close watch on her movements. Sometimes a male is still more restless, and between the outbursts of excitement shown when in the vicinity of the female, will fly backwards and forwards over a considerable area, never many minutes in the same spot, but moving rapidly from tree to tree and bush to bush, occasionally bursting into song. As showing the degree of excitement of the male at this period, I have seen one, prior to the arrival of a female, executing a dance which consisted of a series of jumps up and down on a branch, giving the bird a very comical appearance. Such a dance is not an uncommon thing in bird-life, but generally—in the case of the Song-Thrush for instance—it consists of a series of bounds from side to side.

Where two unpaired males have territories adjoining, and a single female arrives in the territory of one of them, the other one sometimes leaves his own territory and follows her together with the rightful owner, both of them behaving in the usual manner. When thus engaged I have seen two males within a few feet of one another, almost, if not quite,

on the ground amongst the brambles, the female being also close at hand. One of the males would sing quietly, chiefly imitating other species, and the other one would fly at him in a playful manner. All three birds would then leave, both males singing excitedly, the male from the adjoining territory retiring towards his own area, and the other male following the female in the undergrowth. After a short time the intruder would return and commence to sing, but would not interfere. Sometimes, when in the actual presence of the female, one of the males would sing while the other would fly at her with feathers ruffled, those on the head erected, and tail outspread, but on these occasions I could not be certain which male was the rightful owner. What, however, principally interested me when watching this episode, was to notice the manner in which the male who owned the territory, and who ultimately paired with the female, behaved towards the intruder. As I have already mentioned, whenever there is any question of ownership of breeding territory, even if a female is present, a severe struggle ensues, but in this instance this question was clearly absent, and there being nothing to fear from his neighbour, he treated him, as might be expected, with apparent indifference; this, indeed, was most conspicuous. Exactly a week after this incident, a female having arrived in the territory of the remaining unpaired male, pairing at once took place between them.

Where the males are numerous, two or even three pursue one another when a female is present, but I have only seen this taking place in the case of the later courtships, and it is very probable that some of the males that take part in such a pursuit may be already paired. Yet it is a pretty sight to watch them, since the flight is not always a rapid one—as is the case when they are sometimes fighting with one another—but very slow. They extend their wings fully and beat the air in the same way as when following the female. The flight is indeed so slow that their



MALE BLACKCAPS

FACING ONE ANOTHER AT THE END OF THE SLOW FLAPPING FLIGHT
DURING THE PERIOD OF SEXUAL ACTIVITY

ILLUSTRATED BY J. H. FORTER

SWAN ELECTRIC ENGRAVING CO.

BLACKCAP

movements can be followed very easily; they twist in and out of the bushes, generally in a circle, and it is only necessary to remain motionless in the same position in order to see the whole performance. In the middle of this flapping flight two of them will settle on branches opposite and close to one another, and raising the feathers on their heads and bodies, will open wide their bills, and utter a sound which is more like a grunting or croaking than anything else, and is quite unlike any of their usual notes.

At other times there are two females and one male. When this is the case the females pursue and fight with one another. But as a rule the female is little in evidence during all these proceedings, pursuing her way quietly in search of food; in fact, she seems to take no interest at all in the performances of the males. For this reason it is often a difficult matter to find her and follow her movements. She prefers the low shrubs and bushes to the taller trees, but occasionally travels amongst the tops of such trees as larch, in search of food, probably *Chironomidæ*, which are plentiful in these places, or finds her way to the trees which are covered with the climbing ivy, and remaining some time amongst the foliage, feeds quietly on the berries. The only time she really makes her presence known is when she calls to the male, but this is not very often.

The positions assumed by the male during this short period are numerous and extravagant, frequently bordering on the ludicrous. They are an excellent illustration of the effect produced by sexual or other excitement upon a species with a highly developed nervous system; the muscles responsible for the different feather tracts are used indiscriminately, and the positions resulting therefrom are often devoid of any beauty of form. It is difficult to believe that any species can perform a greater variety of antics during such a period. The antics of such birds as the Great Bustard (*Otis tarda*), Birds of Paradise (*Paradiseidæ*), Argus Pheasant, &c., are well known, and are no doubt very wonderful; they attract

attention solely owing to the size of the bird and the conspicuous colouring of the plumage, but in the case of the Blackcap, and also of many other of our most common native species, the conditions are entirely reversed, for they are small, their plumage is inconspicuous and dull, their performances are more quickly executed, and consequently very close attention to their habits is necessary, in order, not only to see, but to realise what is actually taking place. Yet their antics are no less remarkable. The difference is only one of degree, not, however, in the performance, but in the plumage. Imagine the Blackcap possessed of the gorgeous plumes of many other species, and his exhibition would be a truly remarkable one. During this time of excitement the feathers on the head, especially the black cap, are raised, but sometimes alternately raised and lowered, those on the breast and flanks are fluffed out and the throat is often distended, but more particularly so when singing. The feathers on the back are raised disproportionately, giving one the impression that one or two of the longer ones were being moved independently of the others, the wings are drooped or extended fully and flapped, the scapulars raised, the tail-feathers quickly spread out and as quickly contracted, and the tail itself either raised or lowered at various angles. The tail is often spread out to such an extent that large spaces appear between the different feathers, and is sometimes carried at right angles to the body. When the flapping flight is in progress the wings are fully extended, and as far as it is possible to tell, the feathers all over the body are relaxed.

We now come to the part played by the vocal powers in the courtship. According to the theory of sexual selection, song has been developed in the males owing to the females being more sexually excited by, and consequently pairing with, those whose vocal powers were developed in the highest degree. The male Blackcap is one of the most beautiful—and in the opinion of some, *the* most beautiful—of our native songsters. His rich and liquid notes will bear com-



MALE BLACKCAP
ATTITUDE ASSUMED WHEN ITS MATE IS
APPROACHED BY ANOTHER FEMALE

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parison with those produced by any other known species; it is, in fact, difficult to conceive of more beautiful notes being uttered. This development, which is very remarkable, must, in the light of this theory, have arisen from the greater sensitiveness shown on the part of the females for the vocal powers than for the colours of the males, and I do not think that anyone will question this. We ought, therefore, to find that during the courtship the males would utilise their power of song to the best of their ability, but such is not the case. As considerable significance is attached to this point, let me repeat the facts which I have mentioned earlier when describing the courtship. Until the females arrive the males usually sing their true song, but occasionally, especially when excited, imitate other species. Upon the arrival of the females a change takes place, and excitement is at its highest point, with the result that the true song is so far forgotten that, especially during that part of the courtship when the male is close to the female, high-pitched squealing notes, together with imitations, are almost solely produced, and often for a considerable time without a pause. Now let us see how the males behave under the influence of a different kind of excitement. Remove a young one from the nest, when old enough to recognise and reply to its parents, and notice the effect produced. The male approaches within a few yards of you, twists and turns on the branches, or flutters and flaps along the ground, uttering short snatches of its song identically the same as when courting, but more often squealing and imitating other species. Here, then, we have a species which performs, not only during the period of courtship, but also at other periods of excitement in its life, a remarkable series of both bodily and, if I may use the term, vocal antics. We cannot disregard these facts. If the song has really been developed owing to the females showing a greater preference for the males with the more highly developed vocal powers, is it not a little curious that, during the courtship, the true song should be so far forgotten

that the males, in their great excitement, indulge in a medley of imitations of the songs and call-notes of alien species?

The fact that birds with gorgeous plumage do not as a rule possess any great powers of song, and, on the other hand, that the best singers are as a rule dull-coloured, is regarded as an indication of the reality of sexual selection, in so far as it proves that the excitement of the female has been essentially affected by only one of the characters of the male. If this were a true interpretation of the facts, which are not disputed, we should, by the same train of reasoning, expect to find that the bodily and vocal antics have been mutually exclusive, that the best singers do not, during their courtship, perform in a manner which could be interpreted as a display of plumage. But we do not do so. The best singers *do* perform in the most extravagant manner possible, and this seems to me to lessen the importance that is attached by the advocates of this theory to the mutual exclusiveness of gorgeous colouring and beautiful song.

The view I hold with regard to these extravagant bodily antics is that they are reflex actions directly resulting from any excessive excitement, that they are not confined solely to courtship, and do not in any way influence the female. This view, as I am inclined to believe, gains considerable support from the fact that we find a parallel case in the vocal organs, namely, that whenever the excitement reaches a certain degree of intensity, no matter how different the stimulus may be, the reactions that follow are always similar.

If you watch a pair in the evening of the same day upon which the mating has first taken place, you will notice a remarkable change. The excitement has for the time passed away; never, in fact, to return in the same degree of intensity until the following season. Instead of the restless pair that were following one another about during the first hours of daylight, you find a pair simply contented to remain in one another's company. They are often close together, very close sometimes, almost touching one another on the same branch,

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and a note, which I call the mating note, a low gurgling sound, is frequently used by both of them. The male is the more demonstrative of the two, and when near the female he will sometimes raise and quietly flap his wings. They are never separate for very long, but sometimes each travels in his or her own direction in search of food. If, however, the male sings, a reply—the call-note of the species—will generally be forthcoming from the female. On the other hand, they will often travel within a few feet of one another, searching for the *Chironomidæ*, or flying off and on to the ivy berries, the flies not being sufficient to satisfy their hunger. Periodical outbursts of excitement on the part of the male are not uncommon; the cause is often difficult to ascertain, but sometimes it is quite apparent; when, for instance, there is excitement amongst the different individuals of his own or other closely allied species. When two male Garden-Warblers have been excitedly following one another, hopping about amongst the undergrowth, I have seen a male Blackcap join them. The three then proceeded to hop about, keeping close together and warbling quietly, the effect being very pretty.

Such is the life between the time that pairing has taken place and the commencement of the nest, a time which varies in individual cases from a few hours to a day or perhaps more.

When watching a pair during this period it would be a simple matter to describe the affection or devotion that apparently exists between them, but such a description would be misleading. As previously indicated, I believe that the guiding factor of the actions of the male, not so much perhaps of the female, at this period is the sexual passion. I am doubtful whether such an emotion as affection, using the term in the sense applied to human personality, influences their actions in any degree, or, indeed, even exists. There are many birds that pair for life, and there are some that apparently pine for a lost mate, and these facts seem

to show something more than mere passion, but, on the other hand, the negative evidence—that of the callous behaviour of the males, except during the period of sexual passion, of the desertion of the female by the male directly the young are able to take care of themselves, of polygamy, and of the replacement of a lost mate again and again in an incredibly short space of time—is so strong that it precludes the possibility of the existence, in at least a large majority of the cases, of any feeling beyond a momentary passion.

The nest is always placed low down amongst the bushes and undergrowth, holly, elder, or bramble being favourite resorts, but many other shrubs are utilised, and it is sometimes even suspended, after the same manner as that of the Reed-Warbler, from three nettles (*Urtica dioica*). In its construction dead grasses of different sizes are principally used, the coarser ones on the outside and the finer ones in the interior, the lining being of horse-hair. The female does the greater part of the building; the male sometimes helps independently, often singing when doing so, and at other times follows her closely as she searches for material, or watches her vigorous efforts to sever the various grasses, the fixing of which grasses takes considerable time. They shape the nest with their breasts by lying in it and turning round, and if the male happens to be at work when the female arrives, he immediately gives place to her. An inquisitive Chiff-chaff sometimes comes to watch the proceedings, but is immediately pursued. Outbursts of excitement are of common occurrence with the male, and he then pursues the female, erecting his feathers and flapping his wings.

Directly the first egg is laid the male takes his turn in sitting on the nest; and in cold seasons, especially in the mornings, the eggs are never left long exposed, one or other of the birds always showing anxiety to return. Now the time that they leave their eggs exposed, either previous to or during incubation, appears to vary with the prevailing conditions of the atmosphere. This procedure must be congenital, for how

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could a bird recognise, even by the light of previous experience, that there was any connection between a definite temperature of the eggs and the ultimate production of the young; or how could a young bird without experience know this? By some means this instinct is capable of being regulated by external influences,* but by what means this actually takes place we do not know; we do know, however, that if it were not so, certain species that build nests exposed to climatic variations would in a series of cold springs suffer very heavily.

The eggs are usually five in number, one being laid every twenty-four hours. When incubating the male and female change places very frequently. The male leaves the nest in reply to a call from the female, and she then takes his place. While incubating the male often sings, in reply, I believe, to other males.

Incubation lasts about fifteen days, but it is probable that in the case of this and other species, the period may vary with the prevailing climatic conditions.

Few birds display more excitement during the period of incubation than the male Blackcaps; and when a number of pairs inhabit the same wood it is fascinating to watch the gatherings of the males, not only on account of the interest that always attaches to any attempt to investigate the ultimate cause of their actions, but also for the pleasure derived from a close study of the attitudes that result. During this fortnight or three weeks they are very noisy and sing continuously in the mornings, but not so much during the day. Soon after pairing has taken place a deterioration in their vocal powers commences and continues until their

* The notorious case quoted by Romanes in his "Mental Evolution in Animals," of a bird which having placed its nest upon a forcing house, only returned to sit upon the eggs at night when the temperature fell, is corroborative evidence, but I think wrongly ascribed by that great writer to intelligent modification.

song ceases. Their song becomes hurried, new notes are used, and the character of the song is completely altered. They frequently imitate other species, and in addition give utterance to unmusical sounds, which are most difficult to describe, but are sometimes in the nature of a squeal, and at other times more of a hissing, or, again, they may make use of the deeper croaking note referred to previously.

They are not early risers; the Blackbird has probably piped for an hour before there is much stir amongst the community. But a general awakening amongst them is often caused by a male singing or uttering his alarm-note, and in the latter case he may be joined by a female, apparently to investigate the reason, but he rapidly darts off and joins, or is joined by, other males. When the males thus collect together they spread their tails, raise the feathers on their backs and heads, and scold one another vigorously, often moving from place to place. As many as four will sometimes collect round one female, and their antics are then most ludicrous, all of them being in a state of excitement, spreading and flirting their tails. One will, perhaps, warble and imitate other species, another will twist and turn about on a branch, frequently hanging head downwards, and while doing so twisting his head upwards in a grotesque manner. The female at such times seems heedless of their behaviour, and they, on their part, appear to hold her in little regard, for if one male flies away the rest follow and leave her alone. The real husband, if he happens to be present, makes no objection to the proceedings. A Nightingale sometimes has the same effect as the female in drawing the males together, and at other times a Garden-Warbler uttering his harsh cry is quite sufficient, and round the latter the males will collect, croaking and screaming at one another. These outbursts of excitement on the part of the males vary considerably day by day. In some mornings they are almost incessant for an hour or so, and in others they only occasionally take place. They are very spasmodic; everything may be perfectly quiet, when suddenly



MALE BLACKCAP
ATTITUDE ASSUMED WHEN THE MALES ASSEMBLE
FROM ADJOINING TERRITORIES
AND ALSO AT OTHER PERIODS OF EXCITEMENT

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there is a harsh cry from a distant male, and this is sufficient to arouse their passions. It seems as if very little inducement was necessary to prolong this excitement when once aroused. The males collect from adjoining territories, often some distance from where their mates are sitting, and though they seem to assemble more or less in the same place, yet it is difficult to make certain of this, since they move about very considerably. I have, however, noticed that such assemblies occur frequently in the territory of a certain male, while only rarely in that of others adjoining. A male, while incubating, will suddenly leave his nest and dart off to join one of these assemblies, or intrude upon a later pair during their courtship. In the latter case, all three birds become very excited, the males spread their tails, extend their wings, and flap through the air, and the female raises her feathers and screams. The male that is courting undoubtedly resents the presence of the other, for he will attack him, and while doing so will fluff out the feathers on his breast and back, erect his head feathers, and spread out his tail. Whether these assemblies are prompted by a love of play, jealousy, anger, excitement only, or some cause of which we are not at present cognisant, remains a subject for speculation. The direct stimulus is often quite apparent, and this, in most cases, is the presence of a female. It is during the first few hours of the morning, when the females of most species leave their nests, that coition takes place, and I am inclined to think that this is often the cause of the excitement; but it is clear that it is not always so, as, for instance, when the males collect round a member of some other species; though even here sexual passion may be indirectly the cause. The excitement diminishes in intensity week by week, finally disappearing when the young are reared and the males leave their breeding territories.

Sometimes when a pair are quietly feeding amongst the oaks, a second male joins them, an intrusion to which the other male objects, spreading out his tail; on the arrival of

a second female the two males have a scolding contest, facing one another with tails outspread and feathers raised. I do not recollect having seen the two males actually fighting, such contests apparently ending in scolding only.

When excited the males will even sing as they fly. A female may join a pair that are quietly feeding, and when this occurs the male protests in a half-hearted manner, uttering his call-note quickly and turning about on the branches.

Most of the young are hatched during the first or second week in June, and the male shares, equally with the female, the duties of tending them. The male is now most excitable, and if an individual of another species approaches the nest too closely, immediately darts off in pursuit. When brooding he will not leave until almost touched, then flutters off, runs about the ground, squeals, and imitates the notes of other species.

Both of the parents are energetic, but in the presence of danger exhibit somewhat different characteristics. The male is always the bolder, and consequently it is a more difficult matter to persuade the female to overcome her alarm and approach her offspring when one is near the nest. This lack of courage on her part is very marked at all stages of their growth, whether they are just hatched or on the point of leaving the nest, or even after they have flown and all capable to some extent of escaping any danger. When, therefore, you first arrive at the nest you will find that the male, after making a few half-hearted efforts to reach it from different sides, will, while still protesting—which sometimes takes the form of singing even with his bill full of larvæ—make a dash at the nest, and while watching you carefully will dispose of the food, hurriedly placing it in the nearest open gape. With each successful effort his courage increases, and he thus becomes calmer, and before long feeds his offspring naturally. The case, however, is very different with the female. She arrives with her bill full of larvæ, disappears

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into the bushes, then approaches from the opposite direction, disappears again, and finally swallows the food she is carrying. After a short time she again returns, approaches the nest more closely, especially if the male is in front and more or less leading her, but cannot finally make up her mind. This hesitation lasts for some time, and while it lasts she often reaches the nest, settles on the side of it, but even then her courage fails her and again she disappears. In time she becomes callous and feeds naturally, but is always more careful than the male to conceal her approach. That her excitement is considerable is shown by the way she sometimes quivers her wings in the same manner as just previous to coition. The length of time necessary for the parents to overcome their alarm at your presence depends very much on their first impression. If, that is to say, they suddenly return and find you in full view, their courage is more taxed than if you are partially concealed and very quiet.

Both parents are careful after bringing a supply of food to wait for the faeces to be ejected, and when this is done they carry them away and drop them some distance from the nest, or swallow them. I have seen a male still carrying the faeces away when the young had left the nest and were sitting amongst the bushes.

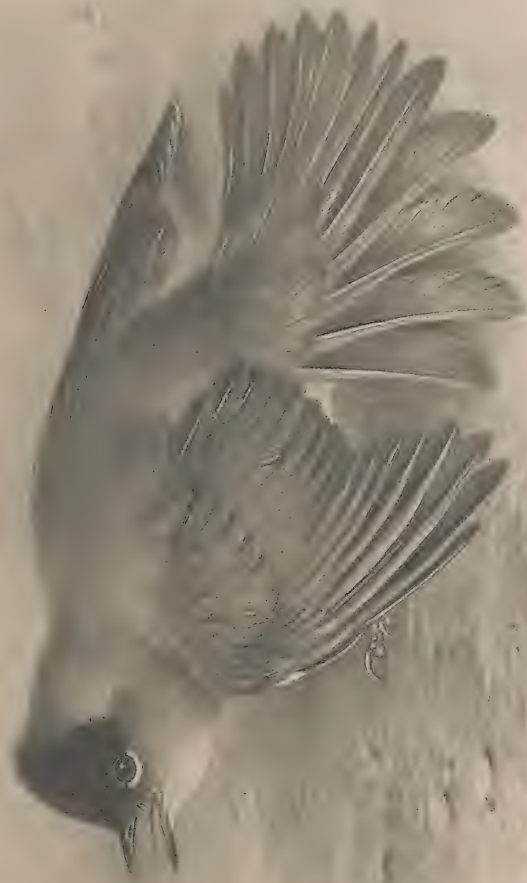
The male frequently sings while his bill is full of larvæ.

The young grow very rapidly. About the fifth day they begin to use, although very quietly, the call-note of the species. They now also preen their feathers and peck at the insects on their bodies after the manner of the adults. About the sixth day they stretch themselves and flap their wings continually. Under ordinary conditions the young remain in the nest until about the ninth day, but as early as the seventh day I have removed a young one for experimental purposes some distance from the nest, and upon my doing so the parents made a considerable commotion and the remaining young immediately left. This commotion attracted, among birds of other species, another male Blackcap; he

hopped about, spreading his tail, waving his wings, singing and warbling, but was vigorously pursued by both parents.

In order to see whether the young are capable of recognising the note of their own parents, I have placed them on the ground or held them in my hand some distance from the nest, and in the territory of another pair. But hitherto I have been unable to obtain any satisfactory results; for it is necessary that one or other of the pair should use the note which exercises such influence on the young. The only reliable method would be to transfer a young one into the territory of a pair who had offspring of much the same size. The song of the male has little influence.

When the young have just left the nest the anxiety of the parents is even greater than before. They are now more or less scattered, and this is especially the case if their departure, on account of any alarm, has been a hurried one. If you happen to be near them the excitement of the parents is intense; but if by holding one in your hand, or even touching it, which is sometimes sufficient, you cause it to utter its alarm-note, this excitement apparently reaches its limit. There is little doubt that it is the limit, since the actions, especially in the case of the male, take the same form as at every other time of extreme excitement. Both parents utter unusually plaintive squeals, which gradually die away, and they flutter about on the ground; the male, hanging on a branch near you, twists and turns about, sometimes head downwards, flirting his tail, erecting his head feathers, and uttering notes which are impossible to describe. When the young are thus scattered it is interesting to notice the effect a certain note of the parents has upon them; their whole aim is to go in the direction of the sound, the attraction seeming almost irresistible. For the purpose of seeing the effect of this note, I have taken a young one when unable to fly, but only to scramble about among the branches, and having placed it upon the ground some distance away, have awaited the results. Its efforts to approach the sound were remarkable



MALE BLACKCAP

ATTITUDE ASSUMED

WHEN THE YOUNG ARE HANDLED

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but its progress very slow ; I therefore, after a short time, lifted it on to the branches, when one of the parents came to it, and by calling and perching close beside it, led it away into the bushes. The alarm-note of the young which has such an exciting influence upon the parents must in some way differ from the ordinary call-note, for this latter note is uttered frequently when they have been some time without food and is quietly replied to by the parents, but what the difference is I have been unable to detect. There is no doubt that it is this note and not the proximity of a human being to their offspring, that exercises such an influence upon the parents. If you place a young one upon your hand and remain perfectly motionless, you will find that the little creature will be devoid of any fear. Its call-note will gradually cease, its eyes will alternately close and open, its feathers all over its body will be relaxed, and drawing its head down between its shoulders, it will finally fall asleep. The greater part of the life of the young at this age is spent in sleep. The alarm-note of the parents has a remarkable effect upon them. If you know where they are in hiding and approach them suddenly, you will find that the parents will utter this note ; an impulse immediately seizes the young, compelling them to fly, but they know not whither nor why, so often, to the despair of the parents, they fly straight at you.

The young continue with the female for some time after they are really capable of taking care of themselves, though the male does not often accompany them. He still sings, but the song is poor ; his outbursts of excitement are less frequent and less intense. Excitement amongst individuals of other species will attract him, and he will frequently be an interested spectator if a Garden-Warbler, disturbed while feeding its young, commences to croak. Sometimes he pursues one of another species, such as a Chiff-chaff, Nightingale, or Hedge-Sparrow, and either plays or fights with him. Towards the end of July the song decreases, and in August practically ceases. During the latter month both sexes are quiet and subdued.

The moulting period extends from the middle of August until the end of September, but they do not all moult at the same time; some have assumed their winter plumage by the beginning of September, while others do not do so until the latter part of that month.

During the autumn they can be easily watched in the elder-bushes, where, attracted by the berries, they collect, and spend the first few hours of the morning, and probably the greater part of the day. When possible it is best to conceal oneself, while yet dark, in the bushes that are known to be frequented: the birds then collect naturally, and are often completely unaware of one's presence. There is at this time of year a very marked change in their temperament; a reaction has set in; the tendency towards extreme excitability, which was the leading characteristic of both sexes, but of the males especially, during the spring and early summer, has disappeared, and we now find sober-minded individuals, prone to a certain amount of playfulness, but apparently more contented when preening their feathers, resting, or feeding. Their games at this period, if they *are* games, are not very interesting to watch and seem to lack vigour; they more often take the form of a scolding match. When three take part there is considerable commotion, but often two fly at, and simply pass by each other without actually fighting. The males, while resting, sing very quietly a song which is scarcely audible twenty yards away, but they do occasionally break out into louder strains, which are very poor compared with those in spring. The quiet song is much the prettier. During the performance the throat is considerably distended, but the effort to produce the sound is apparently not very great. If it were not for the mist and the smell of decaying vegetation it would be easy, when listening to this song, to imagine oneself back again in spring. I have sometimes seen two males, comparatively near, answering one another; while the one was singing the other would turn his head sideways, listening intently, and when the first one had finished, would immediately commence to repeat the strain. But this quiet

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song, such as it is, is more of a warble than a song, through which the real notes can occasionally be traced.

While resting they sit in their characteristic attitude, like a ball of feathers, tails drooping, backs very much rounded, and their head feathers raised. After resting thus for a while they fly to the berries, and, swallowing some, compose themselves for a further repose. I have noticed that about six of these berries are generally sufficient to appease their appetites for a time, but their visits to the trees are frequent, and their digestive powers rapid. As long as an observer remains perfectly still in his retreat, they, like all other wild creatures, take little notice of him; they will only come and look from the opposite side of a branch, disappear, and return again, as if unable to understand his presence; any movement, however, no matter how slight, is sufficient to arouse their suspicions, and cause them to utter their alarm-note, when all within hearing will be on the alert.

I have already referred to the song and powers of imitation of both adult and immature birds, but since their vocal powers are so highly developed, the subject becomes a more than usually interesting one. I shall therefore relate the various phenomena I have noticed in connection with it somewhat minutely. In order to do this, I propose to divide the subject into four parts, and deal with each part separately:—

- (1) The development in the male from year to year.
- (2) The deterioration in both mature and immature individuals immediately coition has taken place.
- (3) Power of imitation.
- (4) Evidence of emulation.

(1) It will be found that in the spring, when the males first arrive, there is a great variation in the quality of the song of the different individuals, that in some cases there is a marked inferiority, which is difficult to describe but easy to detect, while in others the song is so strikingly beautiful as to at once arrest attention. The difference between these two extremes lies principally in the purer notes, which might well

be compared to a flute, the inferior song lacking the fulness or richness of tone, and not being as powerful; and there is also this difference, that that part of the song which contains these notes is not of the same length nor so frequently produced. The inferior song I have sometimes traced to males with dull, undeveloped plumage, but the purer song, which, though not frequent, is not of uncommon occurrence, is invariably the production of males with highly developed colouring and plumage. Between these two extremes the gradations are numerous. It is difficult to prove that such gradations are due to different stages of growth, owing to the impossibility of keeping the same birds under observation from year to year. Nor is it likely that, under confinement, the conditions could be made sufficiently natural for the results to be reliable. But the evidence rather leads to the conclusion that a gradual strengthening and perfecting of the vocal organs does take place, though whether as a result of practice alone, or from a combination of causes, it is impossible to say; and this conclusion gains considerable support from the fact that in the case of other species with highly developed vocal powers, such as the Blackbird (*Turdus merula*), a development can undoubtedly be traced from year to year.

(2) The deterioration of the song is an interesting phenomenon. When the males arrive in spring their vocal powers are at their best; this condition continues until mated, when a gradual deterioration takes place. About the middle of May it is not unusual to hear them commence their song by a single note repeated three times in succession. The song itself now lacks vigour, is shorter and more confused, the beautiful part of it is produced less frequently, and the notes themselves lose much of their original sweetness. I once heard a male that sang beautifully earlier in the spring, repeat continually and almost perfectly the first line of the song "Pop goes the Weasel." Proof that sexual intercourse is the direct cause is lacking. But bearing in mind these

facts, and the analogy of the deterioration of the colour and plumage as a result of the same cause, and that the development of the vocal powers in the spring corresponds with that of the sexual organs, showing how intimately associated the one is with the other; bearing all this in mind, we can with some confidence say that the deterioration, such as we find, is the very result that we should under the conditions anticipate.

(3) Imitation forms a large part of the vocal efforts of the males, and in this respect I have been able to detect little difference between immature and adult birds. In both cases the imitations are very perfect and unmistakable. Many of them are the immediate copies of sounds produced by members of other species; for instance, when a Blackbird utters its alarm-note, a male will sometimes at once repeat it note for note, or when some other species not far distant, such as a Redstart (*Ruticilla phœnicurus*), happens to sing, he will pause in his song and then reproduce a repetition of the sound. This demonstrates how acute their sense of hearing is. But the greater part of this imitation is produced from memory, as is amply shown by the song of the males early in the spring before the species imitated have arrived. Those most frequently copied are the Nightingale and Garden-Warbler, but I have heard in addition to those already mentioned, imitations of the Whitethroat, Sedge-Warbler, Starling (*Sturnus vulgaris*), Thrush (*Turdus musicus*), Linnet (*Acanthis cannabina*), Great Titmouse (*Parus major*), Long-tailed Titmouse (*Acredula caudata*), Missel-Thrush (*Turdus viscivorus*), and Tree-Creeper (*Certhia familiaris*).

The sequence of imitative strains does not appear to be always similar in the same individual; the various imitations being utilised anyhow, the same one is often repeated, and some are made use of much more frequently than others. When, upon further investigation, we attempt to find a solution of the method by which these imitations have reached the

degree of perfection in which we now perceive them, we shall find that the task is neither so simple nor so easy as it may at first appear to be. In a problem, too, of this description, it is well to remember that simple principles of explanation are to be preferred to complex, and in this instance a simple one is at hand, namely, that the imitations have been acquired by each individual during its own lifetime. How far is this explanation satisfactory? It is unquestionably true of a number of cases. The Blackcap replies to the "jug" in the Nightingale's song, repeats the song of the Redstart, or answers the "chuckle" of a Blackbird. In fact, numerous instances could be given of a member of one species producing an immediate representation of the song of one of another; but this is really unnecessary, since it is well known that birds kept in confinement have an innate proclivity for copying the sounds they hear. But this does not exhaust all the possible methods, neither do I think it explains all the phenomena with which we are brought face to face upon closer examination. There are some grounds for believing that part of the imitations may be congenital, the acquired imitation of the parent being transmitted to the offspring. Needless to say, the evidence I have hitherto been enabled to obtain bearing upon this point is far from being complete; a human lifetime is too short for the accumulation of the necessary facts; concerted observation on the part of a number of naturalists can only justify a conclusion, but I place it upon record, hoping that it may be the means of inducing others to investigate what I think may prove a source of knowledge so far as this much-debated controversy is concerned.

I have already mentioned that the colouring of the immature males on their arrival in this country in the spring is not so intense as that of the older birds, and that some of them still carry the brown-tipped feathers on their head; consequently, it is by no means a difficult matter to distinguish them. They are just as vigorous singers, although their song is not so perfect, and their power of imitation is considerable,

parts of the song of the Nightingale and the Garden-Warbler, amongst other species, being introduced. Now these males would not have left the nest until the middle of the previous June, and at this date both the Nightingales and Garden-Warblers are silent; one may, perhaps, hear occasionally a momentary outburst of song from a Nightingale, or a short and quiet warble from a Garden-Warbler, but even this soon ceases, and neither of these species then sing again before leaving this country. These males next return at the beginning of the following April, while the Garden-Warblers do not arrive until some weeks after this date, and the Nightingales about the same time, but they are generally rather later. It is, therefore, clear that they could not have acquired these imitations during the few weeks that they have been in contact with these other species in this country. But there remains the period between September and the following April, the time in which they are resident in their winter home. What happens during these months? My impression has always been that such species as the Nightingale and Garden-Warbler do not sing. If I am wrong in thus thinking, it is clear that they would have had ample opportunity of acquiring them during this period; on the other hand, if I am right, and these species, so far as their song is concerned, are silent, then we can only regard the imitations as congenital.

There are other points in connection with the imitative faculty which are difficult to explain except on the hypothesis of transmission. Why, for instance, in almost every series of imitations, should the song of the Nightingale and Garden-Warbler be introduced? It is true that the males have considerable opportunities of hearing them, but it is also true that there are other species inhabiting the same situations which are more frequent and more persistent singers. Or, how is it that the series of imitative strains is to so large an extent composed of the songs and call-notes of our indigenous species? As far as the song of our own migrants, in their winter home, is concerned, silence may reign, but the males

must have innumerable opportunities of hearing the cries, call-notes, and songs of species foreign to this country; yet they fail to incorporate them, to any appreciable extent, with their song.

The truth is, that much more evidence is required; it must not be forgotten that my facts are collected from, comparatively speaking, a very small area. It is possible that the sequence of imitative strains in the song of the male in other parts of the British Islands does not contain the songs of the species mentioned in so large a proportion, but I can scarcely believe that it can be so; it is more probable that the law of uniformity accompanies the imitative faculty, as it does every other vital manifestation of the animal world, and that for reasons at present unknown to us, certain strains may have been and may be incorporated more readily than others.

Returning once again to the simple explanation with which we set out, namely, individual acquirement, I find it difficult to understand from this point of view why there should be such similarity in the imitations; for with the imitative faculty so strongly implanted, and with different males living in contact, as they undoubtedly do, with different species, we should here look for and surely expect to find some traces of divergent individualism.

There is yet another method by which they may have arisen, although, as we shall see, not a very probable one. Many naturalists believe that the type of the song of different species is a matter of tradition, that is to say, that the parents hand it down to their offspring. This hypothesis requires that the young birds should have had predominant opportunities of hearing their parents' song; but the fact seems to have been lost sight of that there are species, and those, too, in which the vocal powers are developed in the highest degree, that are silent during the period in which they are engaged in tending their young, some of them even remaining so until the following spring. The power of imitation must be founded upon a congenital basis, and if the song had been thus handed

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down, it is difficult to see why the young, when they have so many more opportunities of hearing other species in preference to their own, should sing true to type at all. If it is, therefore, true that in a large number of instances the song could not have been passed on from parent to offspring, it is *à fortiori* true of the imitations which are so essentially a part of the song.

(4) It may seem out of place to allude to emulation under the heading of song, forming, as it does, a small part of a much larger question; but since it has been remarked upon in connection with this species, a brief allusion to it is necessary.

It is no uncommon sight to see the male Blackcaps and Garden-Warblers engaged apparently in a singing contest. They settle within a few yards of one another, and exert themselves to the utmost in simultaneously producing sounds, which are by no means always tuneful. The same scenes occur between Nightingales and Blackcaps, and even between the three species, Blackcaps, Nightingales, and Garden-Warblers. At such times a Nightingale, while singing hurriedly, will pursue a Blackcap. This action may be interpreted as the result of a jealous rivalry, but when we see how prone the Blackcap is to excitement, resulting in the curious assemblies previously referred to, and the similarity of his song, no matter how different the cause of the excitement may be, we must not be too hasty in assuming that an intelligent appreciation of his powers is in any way connected with it.

Their food is a mixture of various fruits and insects. On their arrival in the spring they subsist principally upon the berries of the common climbing ivy (*Hedera helix*), and their bills and throats are often stained with the black juice. They swallow six or more at a time, large and small, and it is surprising how very large a berry they are capable of swallowing

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whole. Insect-life so early in the season is not very plentiful, but they often search the branches for the *Chironomidæ*. As the season advances they feed more upon insects, but I have seen them in May swallowing the young shoots of the Norway Spruce, and in the latter part of that month they search the oaks and other trees for the larvæ of *Tortrix viridana* and *Chimatobia brumata*, and on these larvæ the young are to a large extent fed. In August they frequent gardens in search of raspberries, and as the autumn advances their food consists largely of the berries of the elder (*Sambucus nigra*) and bramble (*Rubus fruticosus*).



PALLAS'S WILLOW-WARBLER.

Phylloscopus proregulus, *Dresser, Birds of Europe*, vol. ix (Supplement), pp. 73-77, pl. 650, fig. 2 (coloured figure of adult male), 1895; *Lilford, Coloured Figures*, vol. iii, p. 72, pl. 36 (coloured figure of adult male), 1897; *Saunders, Manual of British Birds*, 2nd Ed., pp. 63-64 (woodcut), 1897.

German, *Göldhähnchen-Laubsänger*.

DESCRIPTION OF THE PLUMAGE.

Adult Male in Spring.—The upper parts are greyish green washed with yellowish green. The rump is sulphur yellow, the upper tail-coverts the same colour as the back, and the upper surface of the tail greyish brown. The outer edge of the outermost tail-feather is light brownish grey, and the outer edge of the remaining tail-feathers the same colour as the back, though slightly more yellow. The crown has a somewhat indistinct yellowish white stripe in the centre extending to the nape, and a conspicuous chrome yellow superciliary stripe commences at the forehead and extends behind the eye. The lores are dark greyish green, and the cheeks and sides of the neck grey washed with whitish yellow. The wing is ash brown, the least and medium coverts greenish grey, the latter being tipped with white; the primary coverts are ash brown edged with greenish yellow, and the secondary coverts ash grey edged with greenish grey and tipped with yellowish white; the wing has thus two distinct white stripes across it. The flight-feathers are ashy brown edged with greyish green, the

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innermost secondaries being tipped with white. The posterior edge of the primaries is brownish white. The under parts generally are whitish, but the throat is of a more whitish grey colour tinged with yellow, which colour continues down the breast, where it forms indistinct longitudinal stripes. The abdomen is white, the flanks tinged with greenish yellow, and the under tail-coverts whitish grey washed with light yellowish green. The under side of the tail and wing is greyish lavender, the flight-feathers being edged with white. Axillaries are sulphur yellow and the edge of the wing chrome yellow. The bill is horn black, the lower mandible being buff colour at the base, and the iris dark brown. Feet are flesh brown with yellowish green soles.

GEOGRAPHICAL DISTRIBUTION.

There are only two records of the occurrence of this Warbler in **Europe**, one being obtained on the coast of Norfolk, and the other on the Island of Heligoland.

In **Eastern Siberia** it is by no means rare, occurring in the Province of Yeniseisk, on the River Lena, near Lake Baikal, in the vicinity of Irkutsk, and on the left bank of the River Selenga. It is also found to the south of the River Ussuri, on the borders of Lake Khanka, and in the neighbourhood of Baranovsk. Large numbers pass through **Pekin** on migration. Throughout the **Himalaya Mountains** it appears to be not uncommon, and in winter visits the hills in **Manipur** and **Tenasserim**.



RADDE'S BUSH-WARBLER.

Lusciniola schwarzi, Saunders, *Manual of British Birds*, 2nd Ed., pp. 73* 74* (woodcut), 1899.

DESCRIPTION OF THE PLUMAGE.

Adult Male in Autumn and Winter.—The upper parts are uniform olive brown, but the upper tail-coverts are of a rather more rusty colour, and the outer edges of the primaries and tail-feathers more yellowish. There is a distinct buffish yellow superciliary stripe ending somewhat abruptly, the lores are blackish, and the cheeks brownish grey with a light narrow stripe in the middle of each feather. The throat is whitish, the crop more of a buff colour—some specimens showing a slight vinous tint—and this colour extends down the flanks. The under tail-coverts are whitish buff, and the abdomen pure white. In some specimens the under parts have a more olive yellowish appearance. The under part of the tail is lavender brown, and the shafts of the feathers whitish. The feet are buffish flesh colour, iris brown, and the bill horn colour, the lower mandible being buffish yellow at the base.

In the spring the yellow on the under surface seems to be the predominating colour, and the upper parts are olive.

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GEOGRAPHICAL DISTRIBUTION.

One specimen has been obtained on the coast of **Lincolnshire**, this being the only European record.

The home of the species is principally **Eastern Siberia**, the western limit being the district round Lake Baikal, and the eastern the country of the River Amur, including the Island of Saghalien, which it visits in considerable numbers. In winter it visits **Southern China**, **Pegu**, and the northern and central parts of **Tenasserim**.



FEMALE CLIFF-CHAFF.



GAIKEN-WARBLE

GEOGRAPHICAL DISTRIBUTION DURING SUMMER





100° F. ISOTHERM.

TEMPERATURE DISTRIBUTION DURING WINTER.

PREPARED BY D. H. DODGE



BLACKCAP.

